Predictors of Beginning and Ending Caregiving During a 3-Year Period in a Biracial Community Population of Older Adults

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Caring for an ill or a disabled family member or friend is an increasingly common experience¹ that may have substantial public health implications. As the US population ages and the burden of chronic disease grows,² factors that affect the supply of caregivers are of increasing importance, especially among older adults, who represent a considerable proportion of all caregivers.3-8 This is also the age group that is most likely to require care and most vulnerable to the health effects of caregiving. However, few studies have examined whether demographic and health factors influence the process of becoming a caregiver or relinquishing the caregiver role.

Longitudinal studies of predominantly older caregivers have found that those who reported more psychological and physical care-related strain experienced greater morbidity9-12 and mortality13 over time. However, most longitudinal studies enrolled people who had already been providing care and therefore these studies cannot distinguish between health status before starting caregiving and changes in health during caregiving. Studies that begin with current caregivers have 2 limitations that may be more pronounced among older adults. First, studies that follow only caregivers cannot provide information on whether health changes occur at rates similar to rates in noncaregivers of the same age. Second, studies that compare current caregivers with noncaregivers may have difficulty identifying an appropriate comparison group if health effects of caregiving have already occurred and may severely underestimate or overestimate the health effects of caregiving. As Baumgarten et al.⁹ noted, caregivers with rapidly deteriorating health are more likely than caregivers without health problems to stop caregiving and may be underrepresented in research studies

Objectives. We sought to identify predictors of beginning and ending caregiving. Methods. At baseline and 3-year follow-up, we interviewed 4245 community residents (61.4% Black, 38.4% White, 0.20% other) aged 65 years or older. We used logistic regression to test predictors of beginning caregiving among baseline noncaregivers and of continuing caregiving among baseline caregivers.

Results. After control for demographic variables, physically healthier individuals were significantly more likely to become caregivers and to continue caregiving. Mental health had little influence on beginning caregiving, but declining mental heath was associated with continuing caregiving.

Conclusions. Maintenance of physical health and function is essential to the ability of older adults to begin and to continue caregiving. Studies that compare the health of current caregivers with that of noncaregivers may substantially underestimate the impact of caregiving on health. (*Am J Public Health.* 2004;94: 1800–1806)

that do not begin observation before the start of care.

Three small studies examined changes in caregivers' mental and physical health before and after caregiving began. 14-16 Two of the studies found no differential effect of entry into caregiving on mental and physical health over 1 year¹⁵ or on depression over 3 years, 16 and 1 study 14 found increased depression and decreased happiness over 5 years. A large study 17 found that nurses who began caring for a spouse during a 4-year interval (1992-1996) were twice as likely as noncaregivers to experience an increase in depressive and anxious symptoms; the odds of experiencing these symptoms increased with an increasing number of weekly hours of care. These studies provide preliminary data on changes in health after entry into caregiving but do not consider whether caregivers' physical or mental health is associated with beginning or ending caregiving. To our knowledge, only 1 study 12 has provided data on whether caregivers' health differs from that of others their age before these caregivers begin to provide care. That study found no difference in baseline measures of depression or self-assessed health between

spouses who remained noncaregivers and those who began caregiving.

Our study followed a large community population of older adults (61.4% Black, 38.4% White, 0.20% other) and measured health and caregiver status at baseline and 3 years later. This design allowed us to measure demographic and health variables of participants and to determine which noncaregivers subsequently became caregivers. We also followed people who were caregiving at baseline to see if specific demographic and health characteristics contributed to continuation or end of care. Obtaining such information about caregivers before they begin providing care has several potential benefits. The information may provide a more complete understanding of the relationship between caregiving and health; it can inform the choice of appropriate comparison groups for future studies of the health effects of caregiving; and it may provide data to more accurately identify the future pool of older caregivers. In addition, knowledge of factors associated with ending caregiving may permit earlier and more suitable targeting of resources to informal caregivers.

METHODS

Setting and Participants

Data were obtained from the Chicago Health and Aging Project (CHAP), a large cohort study in a geographically defined community. A door-to-door census identified all residents aged 65 years or older. Of these, 6158 (81.4% of Blacks; 75.1% of non-Blacks) participated in a baseline in-home interview that included structured questions about health and physical function; 5924 persons (96.2%) also answered questions about informal caregiving responsibilities and were classified as caregivers (n=611) or noncaregivers (n=5313) at baseline. Nine percent of baseline caregivers died before the 3-year followup, compared with 18% of noncaregivers. Mortality was greater for males, Blacks, and older persons. Of the survivors, 87% (n= 4245) participated in an in-home interview similar to the baseline interview approximately 3 years after baseline, and these participants are the subjects of the present study. Follow-up participation (88% of caregivers vs 87% of noncaregivers) did not vary significantly by race/ethnicity, gender, age, or baseline caregiver status.

Measures

At baseline, age was determined from date of birth, race/ethnicity from the US Census question, and education from years of formal schooling. Total annual family income was assessed by means of 10 categories and the "show-card" method. 18 Marital status was classified as currently married or not married.

Caregiving data. Caregiving was defined as currently providing unpaid assistance to people of any age owing to health problems, illness, or disability and was assessed at baseline and 3-year follow-up. Caregiving included help with personal and instrumental activities of daily living and health-related care. New caregivers were participants who indicated caregiving at follow-up but not at baseline. Caregivers reported the number of days they provided care in a typical week (0.5-7 days) and the amount of time spent providing care each day (1-24 hours); these figures were multiplied to obtain the total weekly hours of caregiving. Relationship of the caregiver to the care recipient was coded

to 5 categories (spouse, parent, child/grandchild, other relative, or friend).

Measures of health and physical function. Disability, depressive symptoms, and general health status were obtained for all participants by means of self-report measures with established reliability and validity in community populations. The modified Katz Activities of Daily Living Scale¹⁹ measures an individual's ability to perform, without assistance, 6 basic activities of daily living (e.g., bathing, dressing). The Rosow-Breslau Functional Health Scale²⁰ measures 3 aspects of gross mobility (e.g., climbing a flight of stairs), and the Nagi Scale²¹ measures difficulty performing 5 types of physical activity (e.g., stooping, handling small objects). Ability to perform an activity without assistance (Katz scale and Rosow-Breslau scale) or with little or no difficulty (Nagi Scale) was coded as no disability for that item. For each measure, items were summed to produce a score ranging from 0 (no disability) to the maximum score indicating disability on all items (6 for the Katz scale, 3 for the Rosow-Breslau scale, and 5 for the Nagi Scale).

Depressive symptoms were assessed with the 10-item short form of the Center for Epidemiologic Studies Depression Scale,²² which has a yes/no response format and yields a score of 0 to 10. Self-rated physical and mental health was assessed with the 4-item Health-Related Quality of Life measure.²³ Participants rated their overall health as poor, fair, good, or excellent and estimated the number of days in the previous month that their physical health was not good, their mental health was not good, and health problems limited their usual daily routine. Systolic and diastolic blood pressure were measured according to the protocol of the Hypertension Detection and Follow-Up Program.²⁴

Statistical Analysis

We used logistic regression to examine the effect of demographic and health variables on 2 outcomes at follow-up: (1) for noncaregivers at baseline, the probability of being a caregiver at 3-year follow-up (new caregiver); and (2) for caregivers at baseline, the probability of also providing care at 3-year followup (continuing caregiver). Each model included the main effects of age, male gender,

Black race/ethnicity, and marital status (currently married). One at a time, we added years of education and income group and terms capturing the interaction of age, gender, race/ethnicity, and marital status with one another. To identify terms that were statistically significant when added individually and were most predictive of the 2 outcomes, we entered the terms in a stepwise fashion to a model that contained the main effect terms of age, gender, race/ethnicity, and marital status. The scales of disability and general measures of physical health were conceptually related because all involved the participant's perception of his or her physical condition, and the baseline measures were mathematically correlated (r:.20-.72). Conceptually and analytically, it would not be appropriate to include all measures in a single model. Therefore, we used separate models adjusted for significant demographic variables to examine the effect of both baseline level and 3-year change in level of each physical and mental health variable on beginning and continuing caregiving. We then examined multivariate stepwise models for the 2 outcomes, adjusted for demographic variables. We examined the interaction of race/ ethnicity and each of the health variables to determine whether the effect of these variables on beginning and continuing caregiving differed by race/ethnicity. Because spouses may feel more obliged to provide care despite their own health problems, we checked for the interaction of spousal relationship with health variables in analyses of continuing caregiving and for the interaction of marital status with health variables in analyses of beginning care.

RESULTS

The average follow-up interval was 3.3 years (SD=0.44 year). Of the 4245 participants, 3756 were noncaregivers and 489 were caregivers at baseline. Whereas 6% (n=222) of baseline noncaregivers began providing care during the study (new caregiver), only 29% of baseline caregivers (n=143) were still providing care 3 years later (continuing caregiver). Baseline characteristics of the participants are shown in Tables 1 and 2.

TABLE 1-Baseline Characteristics of Participants in Analyses of Beginning Care

Characteristic	Began Caregiving (n = 222)	Remained a Noncaregiver (n = 3534)	Total (N = 3756) 74.1 (6.5)	
Age, y	72.0 (5.0)	74.2 (6.5)		
Education, y	11.7 (3.4)	12.0 (3.8)	12.0 (3.7)	
Katz Activities of Daily Living ¹⁹ scale items unable to perform, no.	0.05 (0.3)	0.2 (0.9)	0.2 (0.8)	
Rosow-Breslau Functional Health Scale ²⁰ items unable to perform, no.	0.3 (0.7)	0.6 (0.9)	0.6 (0.9)	
Nagi ²¹ items performed with difficulty, no.	0.7 (1.1)	1.0 (1.4)	1.0 (1.3)	
Days of poor physical health, no.	3.1 (7.4)	3.8 (8.4)	3.7 (8.3)	
Days that health problems limited routine, no.	1.8 (5.7)	1.9 (6.2)	1.9 (6.2)	
Days of poor mental health, no.	1.8 (5.1)	2.2 (6.6)	2.2 (6.5)	
Center for Epidemiologic Studies Depression Scale ²² score	1.4 (1.6)	1.5 (2.0)	1.5 (2.0)	
Systolic blood pressure, mm Hg	139 (19)	140 (20)	140 (20)	
Diastolic blood pressure, mm Hg	77 (11)	77 (12)	77 (12)	
Black, %	65	61	61	
Male, %	41	38	38	
Married, %	67	44	46	
Income group, median, \$	20 000-24 999	15 000-19 999 15 000-1		
Self-assessed health	Good	Good	Good	

Note. Unless otherwise indicated, values are given as mean (SD).

Beginning Care

Marital status, age, and gender were significantly associated with beginning caregiving (Table 3). Married participants were more than twice as likely as unmarried participants to begin caregiving. Interactions of age with both gender and marital status were significant in separate models but in stepwise selection, the age-gender interaction was stronger, so that interaction was retained for the final model. In that model, after control for race/ ethnicity and marital status, the probability of beginning to provide care was 11% for women and 4% for men at age 65 years. At age 75 years, the probability was 5% for both genders. By age 85 years, the probability had decreased to 2% for women and had risen to 6% for men. Race/ethnicity, education, and income were not significantly associated with beginning care, nor were there any other significant interactions among the demographic variables.

In models that include control for demographic variables, only 3 baseline health factors were associated with beginning caregiving (self-assessed health, Katz scale score, and

Rosow-Breslau scale score; data not shown). In the next models (Table 3, single-health-factor models), we included demographic variables plus 2 variables for each health factor: baseline level and change in level over 3 years. Both baseline and change variables were associated with beginning caregiving for the 3 measures of disability and for days of poor physical health. The association of the Katz Activities of Daily Living Scale score with beginning caregiving was particularly strong. An individual with 1 Katz scale disability at baseline was less than half as likely as a person with no Katz disability to begin caregiving; after control for baseline disability, each additional Katz disability during the 3 years halved the probability of beginning caregiving. For self-assessed health, only the baseline measure was significant. For days that health problems limited usual routine, an increase in days over 3 years was associated with a decreased probability of beginning caregiving. Days of poor mental health, Center for Epidemiologic Studies Depression Scale short-form score, and measures of blood pressure were not significant. There were no

significant differences by race/ethnicity or marital status in physical or mental health effects, whether measured as baseline health or change in health. In the stepwise model (Table 3), in which both baseline and change variables were added in pairs, higher Katz scores at baseline and follow-up were associated with a decreased probability of beginning caregiving, as were higher Rosow–Breslau Scale scores at follow-up. An increase in Center for Epidemiologic Studies Depression Scale scores at follow-up was associated with an increased probability of beginning caregiving.

Continuing Care

Among baseline caregivers, those who were married, younger, or White were more likely than their opposite counterparts to be providing care at follow-up (Table 4). Gender, education, and income were not significantly associated with continuing caregiving, nor were weekly hours spent in care-related tasks (odds ratio $[OR]=1.003;\ 95\%$ confidence interval $[CI]=0.999,\ 1.007;\ P=.18)$. After control for marital status, spousal relationship to recipient was not significant $(OR=1.5;\ 95\%\ CI=0.90,\ 2.6;\ P=.12)$. None of the interactions among age, gender, marital status, and race/ethnicity were statistically significant.

In models that controlled for demographic variables, baseline levels of health factors were not associated with continuing caregiving (data not shown). However, when both baseline health and change in health over 3 years were included, 3 factors were significant (Table 4, single-health-factor models). Individuals with Katz disabilities at baseline were less likely to continue caregiving, and for each additional Katz disability accumulated during the 3-year interval, the probability of continuing caregiving decreased by nearly half. An increase in days of poor physical health over 3 years decreased the probability of continuing caregiving after control for the baseline level of physical health. Conversely, an increase in days of poor mental health increased the probability of continuing caregiving. No other health measures were associated with continuing caregiving, nor were there significant differences by race/ ethnicity for baseline health or change in

TABLE 2—Baseline Characteristics of Participants in Analyses of Continuing or Ending Care

Characteristic	Continued Caregiving (n = 143)	Stopped Caregiving (n = 346)	Total (n = 489) 72.9 (5.7)	
Age, y	72.0 (4.8)	73.2 (5.9)		
Education, y	12.9 (3.1)	12.1 (3.4)	12.3 (3.4)	
Katz Activities of Daily Living Scale ¹⁹ items unable to perform, no.	0.01 (0.1)	0.08 (0.4)	0.06 (0.3)	
Rosow-Breslau Functional Health Scale ²⁰ items unable to perform, no.	0.2 (0.5)	0.4 (0.7)	0.3 (0.6)	
Nagi ²¹ items performed with difficulty, no.	0.6 (1.1)	0.8 (1.2)	0.7 (1.2)	
Days of poor physical health, no.	3.1 (7.5)	3.1 (7.7)	3.1 (7.6)	
Days that health problems limited routine, no.	1.5 (5.9)	1.3 (5.1)	1.4 (5.3)	
Days of poor mental health, no.	3.6 (8.1)	3.0 (7.9)	3.2 (8.0)	
Center for Epidemiologic Studies Depression Scale ²² score	1.7 (2.0)	1.7 (2.0)	1.7 (2.0)	
Systolic blood pressure, mm Hg	138 (18)	137 (18)	137 (18)	
Diastolic blood pressure, mm Hg	76 (10)	78 (11)	77 (11)	
No. hours per week providing care	41 (49)	35 (48)	37 (48)	
Black, %	59	69	66	
Male, %	35	36	36	
Married, %	71	61	64	
Income group, median, \$	20 000-24 999	15 000-19 999	15 000-19 999	
Self-assessed health	Good	Good	Good	
Relationship to care recipient at baseline interview, %				
Caring for spouse	48	37	40	
Caring for parent	15	14	14	
Caring for child or grandchild	10	11	11	
Caring for other relative	22	20	21	
Caring for friend	5	18	14	

Note. Unless otherwise indicated, values are given as mean (SD).

health. Health effects were similar for participants caring for spouses and participants caring for others. In the stepwise model (Table 4), in which both baseline and change variables were added in pairs, higher Katz scores at baseline and follow-up were strongly associated with a decreased probability of continuing caregiving; more days of poor mental health at baseline and follow-up were strongly associated with an increased probability of continuing caregiving.

DISCUSSION

For 3 years, we followed residents of a defined biracial community who were aged 65 years or older and gathered new information about informal caregiving. Most previous studies started by identifying the recipient of care and then locating the caregiver. This indirect approach does not identify caregivers before they begin to provide care, so it is not possible to prospectively measure potentially important predictors of entry into caregiving. Data from our study demonstrated the importance of physical health in the caregiver selection process. When demographic variables were controlled, physically healthier individuals were more likely to become caregivers and to continue caregiving. If baseline measures alone could predict caregiving, we would have long-term indicators of the potential caregiving pool. However, in this older population, health changes were sufficiently common that proximate measures of health

were necessary. The combined influence of baseline and change measures indicates the importance of good health to the ability to begin caregiving. We know that the baseline component did not result from caregiving, because these individuals were not providing care at baseline. However, changes in health during the follow-up interval may have been the result of caregiving.

A study of transitions in spousal caregiving 12 found no association of baseline self-assessed health or depression with becoming a caregiver, although entry into caregiving was associated with significant declines in physical and mental health. In our data, measures that could directly impede caregiving, such as disability and self-assessed health, were the strongest predictors of beginning caregiving, whereas blood pressure, which does not directly hinder function, was not significant. Depression was a weak predictor of beginning caregiving, with a small estimate of effect and only in the multivariate analyses after control for the stronger physical predictors. Only the change component reached statistical significance, suggesting an increase in depression early in the caregiving situation. Because these health factors do not cause caregiving but rather eliminate people from the pool of potential providers, the stepwise model should not be viewed as a final explanatory construct. The other health factors are still useful alternative predictors.

Physical health was an important predictor of beginning care, even without control for information about closeness to an individual who needed assistance, although demographic factors such as marital status may be surrogates for this opportunity. Married people were more than twice as likely as unmarried people to become caregivers, and 70% of married people who started caregiving cared for spouses. However, the effect of health predictors on beginning caregiving was similar in married and unmarried participants, suggesting that spouses were not more likely than nonspouses to begin caregiving when their own health was poor. The substantially lower probability of women, compared with men, beginning caregiving at older ages may also be related to opportunity, because a lower proportion of spouses of women survived for the 3-year interval.

TABLE 3-Odds Ratios in Logistic Regression Models for Providing Care (New Caregivers) at 3-Year Follow-up Among Baseline Noncaregivers (N = 3756)

Predictor	Single-Health-Factor Models		Stepwise Model	
	Odds Ratio (95% Confidence Interval)	P	Odds Ratio (95% Confidence Interval)	Р
Demographic variables ^a	,			
Married (vs unmarried)	2.41 (1.76, 3.30)	.0001	2.40 (1.75, 3.31)	.0001
Male	0.59 (0.43, 0.81)	.0001	0.53 (0.38, 0.74)	.0001
1 Year of age if female	, , ,	.0001	, , ,	.0001
1 Year of age if male	0.92 (0.88, 0.95) 1.02 (0.98, 1.06)	.0001	0.94 (0.91, 0.98) 1.04 (1.00, 1.09)	.003
•	, , ,	.470	, , ,	.24
Black (vs White) Katz Activities of Daily Living Scale score ^b	1.11 (0.83, 1.50)	.470	1.20 (0.89, 1.63)	.24
, ,	0.40 (0.05, 0.70)	001	0.54 (0.24, 0.02)	.03
1 Item unable to perform at baseline	0.42 (0.25, 0.72)	.001	0.54 (0.31, 0.93)	
1 Additional item at follow-up	0.50 (0.33, 0.78)	.002	0.62 (0.40, 0.96)	.03
Rosow-Breslau disability score ^b	0.04 (0.54, 0.00)	0004	0.70 (0.50 4.00)	00
1 Item unable to perform at baseline	0.64 (0.51, 0.80)	.0001	0.78 (0.59, 1.03)	.08
1 Additional item at follow-up	0.64 (0.51, 0.79)	.0001	0.72 (0.57, 0.91)	.006
Nagi disability score ^b				
1 Item unable to perform at baseline	0.82 (0.72, 0.94)	.005		
1 Additional item at follow-up	0.80 (0.70, 0.91)	.001		
Category of self-assessed health ^b				
Poorer health at baseline	0.77 (0.63, 0.95)	.01		
Decline in health at follow-up	0.86 (0.71, 1.04)	.12		
Days of poor physical health ^b				
1 Day at baseline	0.97 (0.95, 0.99)	.02		
1 Day increase at follow-up	0.98 (0.96, 0.99)	.02		
Days that health problems limited routine ^b				
1 Day at baseline	0.98 (0.95, 1.01)	.12		
1 Day increase at follow-up	0.97 (0.95, 0.99)	.006		
Days of poor mental health ^b				
1 Day at baseline	0.99 (0.97, 1.02)	.62		
1 Day increase at follow-up	1.00 (0.98, 1.02)	.86		
Center for Epidemiologic Studies Depression				
Scale score ^b				
Baseline depression	1.01 (0.92, 1.10)	.86	1.08 (0.99, 1.18)	.10
Increase in depression at follow-up	1.04 (0.96, 1.11)	.34	1.09 (1.01, 1.17)	.02
Systolic blood pressure ^b	, , ,		, , ,	
Baseline	1.00 (0.99, 1.01)	.82		
Increase at follow-up	1.00 (0.99, 1.01)	.69		
Diastolic blood pressure ^b	(, <u>-</u>)			
Baseline	0.99 (0.98, 1.01)	.20		
Increase at follow-up	1.00 (0.99, 1.01)	.80		

^aln one model.

Just as healthier individuals were more likely to become caregivers, caregivers who remained physically healthy were more likely to continue caregiving and, again, the measures of disability were most strongly predic-

tive of continuing caregiving. It is striking that caregivers' physical health was significantly related to continuing caregiving, despite the fact that some of those who stopped likely did so because the recipient no longer needed

care rather than because of their own health problems. This association might have been stronger if we had been able to restrict our analysis to those who ended caregiving while the recipient was still in need. Thus, our findings may underestimate the importance of good physical health in continuing the caregiver role. In contrast to findings for physical health, a decline in mental health over 3 years was associated with continuing caregiving. This association suggests that in the general population, continuing to provide care negatively affects mental health but does not cause cessation of care.

Married people were much more likely than unmarried people to continue providing care, possibly because most were caring for spouses and may have had a greater incentive to continue because of strong emotional ties. Seltzer and Li¹⁶ found that daughters were significantly more likely than wives to institutionalize the recipient of their care, and other investigators have reported similar findings.^{25,26} Although married people were more likely to continue caregiving, we found that the effect of health predictors was similar in spouse and nonspouse caregivers, suggesting that spouses were not more likely than nonspouses to continue caregiving when their own health deteriorated. Perhaps younger caregivers were more likely to continue caregiving because they had better stamina and because their recipients were more likely to be younger and to survive longer. Continuing caregiving was not associated with hours of care provided each week, an indirect measure of care recipient need.

We found that Black caregivers were less likely than White caregivers to continue providing care. Previous studies²⁷⁻²⁹ found that Blacks were less likely than Whites to use nursing homes. This apparent discrepancy may owe to transfer of caregiving to another informal provider; research indicates that Black caregivers are more likely than White caregivers to share caregiving responsibilities.³⁰ The greater mortality among Black participants did not affect these analyses, because we included only providers who survived to the second interview. We carefully tested for racial differences in the effect of health predictors on both beginning and continuing caregiving and found none. Because

^bModel includes demographic variables.

 $^{^{}c}P$ = .0001 for the age–gender interaction.

TABLE 4-Odds Ratios in Logistic Regression Models for Providing Care (Continung Caregivers) at 3-Year Follow-up Among Baseline Caregivers (n = 489)

Predictor	Single-Health-Factor Models		Stepwise Model	
	Odds Ratio (95% Confidence Interval)	Р	Odds Ratio (95% Confidence Interval)	Р
Demographic variables ^a				
Married (vs unmarried)	1.64 (1.06, 2.54)	.03	1.61 (1.02, 2.52)	.04
Male	0.86 (0.56, 1.32)	.49	0.90 (0.58, 1.40)	.65
1 Year of age	0.95 (0.92, 0.99)	.01	0.97 (0.93, 1.00)	.08
Black (vs White)	0.57 (0.38, 0.87)	.01	0.54 (0.35, 0.84)	.006
Katz Activities of Daily Living Scale score ^b				
1 Item unable to perform at baseline	0.15 (0.02, 1.02)	.05	0.12 (0.02, 0.89)	.04
1 Additional item at follow-up	0.60 (0.36, 0.99)	.04	0.57 (0.33, 0.97)	.04
Rosow-Breslau disability score ^b				
1 Item unable to perform at baseline	0.68 (0.46, 1.01)	.06		
1 Additional item at follow-up	0.81 (0.61, 1.08)	.15		
Nagi disability score ^b				
1 Item unable to perform at baseline	0.82 (0.66, 1.02)	.07		
1 Additional item at follow-up	0.84 (0.70, 1.02)	.07		
Category of self-assessed health ^b				
Poorer health at baseline	0.95 (0.71, 1.29)	.74		
Decline in health at follow-up	0.94 (0.71, 1.26)	.69		
Days of poor physical health ^b				
1 Day at baseline	0.98 (0.94, 1.01)	.17		
1 Day increase at follow-up	0.97 (0.94, 0.99)	.03		
Days that health problems limited routine ^b				
1 Day at baseline	1.00 (0.96, 1.05)	.87		
1 Day increase at follow-up	0.98 (0.96, 1.01)	.25		
Days of poor mental health ^b				
1 Day at baseline	1.03 (1.00, 1.06)	.06	1.04 (1.01, 1.08)	.01
1 Day increase at follow-up	1.03 (1.00, 1.05)	.03	1.03 (1.01, 1.05)	.01
Center for Epidemiologic Studies Depression				
Scale score ^b				
Baseline depression	1.04 (0.92, 1.16)	.54		
Increase in depression at follow-up	1.03 (0.92, 1.15)	.63		
Systolic blood pressure ^b				
Baseline	1.01 (1.00, 1.02)	.24		
Increase at follow-up	1.01 (1.00, 1.02)	.07		
Diastolic blood pressure ^b				
Baseline	0.98 (0.96, 1.01)	.14		
Increase at follow-up	1.00 (0.98, 1.01)	.61		

aln one model.

our population included large numbers of both Black and White participants, it was well suited to identifying such differences. Although some previous studies found Black caregivers to be less depressed than White caregivers,³¹ the researchers in those studies did not examine the association of depression

with continuing care. One study found poorer physical health among Blacks, 32 but this effect was not limited to caregivers, and this study also did not examine the relation of health to continuing care.

Our population-based longitudinal study had several advantages. The most unique aspect was that we were able to measure the health of people before they became caregivers to examine how health affects entry into caregiving. The study was large and community based and included both Black and White participants. We identified all caregivers in the population, not just a convenience sample of volunteers, and we uniformly ascertained caregiver status. We directly identified the people providing care without reference to the health condition or the needs of the care recipient, and, except for the age restriction of 65 years or older, we did not restrict participation on the basis of caregiver or recipient characteristics. For these reasons, caregivers were more likely representative of older caregivers in the community.

Our study also had limitations. Because it was part of a larger study, data collection was limited and did not include care recipient characteristics. However, lack of these data does not diminish the importance of our findings for public health, because comparisons with noncaregivers involve differences associated with having or not having caregiving responsibilities. The comparisons do not involve differences in the caregiving situation itself. Regardless of the circumstances necessitating care, those in better health were more likely to assume the caregiver role. Data concerning ending caregiving highlight the difficulty of distinguishing health changes due to providing care from health changes that prompt a person to stop caregiving. Only a study with multiple observations of the sequence of events could conclusively distinguish between these circumstances. Finally, because this study was restricted to adults aged 65 years or older, the findings may differ in younger populations.

In summary, we found that among older White and Black adults, those who became caregivers were physically healthier than those who remained noncaregivers and that ending caregiving was more likely among caregivers whose physical health declined. The new information provided by this study has valuable research and public health implications. If physical health is an important caregiver selection factor, longitudinal studies that begin with current caregivers may substantially underestimate the impact of care-

^bModel includes demographic variables.

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giving on health, especially among older people, who are most at risk for health problems.³³ Future studies should consider caregiving effects not by comparison with all people in an age goup but rather by comparison with other relatively healthy people. The ability to predict which older adults in the population are most likely to begin and to end caregiving may provide better estimates of the future supply of older caregivers and may assist health professionals to identify current caregivers most in need of their services. The considerable influence of disability on beginning and continuing caregiving underscores the importance of designing interventions to help older adults maintain physical health and function. It also suggests that caregiver intervention programs, which typically focus on psychoeducational activities, should direct attention to caregivers' physical health. Among older caregivers, maintenance of physical health and function is essential to the ability to continue caregiving.

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Contributors

Judith J. McCann was responsible for study concept and design, analysis and interpretation of the data, and preparation of the article. Liesi E. Hebert was responsible for analysis and interpretation of the data and preparation of the article. Julia L. Bienias provided statistical expertise regarding analysis and interpretation of the data. Martha Clare Morris and Denis A. Evans were responsible for study concept and design, acquisition of data, and critical review of the manuscript.

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Human Participant Protection

The study was approved by the institutional review board of Rush University Medical Center, and all participants provided signed informed consent.

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